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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,866	08/21/2003	Yasunari Hisamitsu	50195-380	6867

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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	**PAPER NUMBER**
1745	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/644,866	HISAMITSU ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed July 19, 2007. Claims 1, 7 and 20 have been amended. Claims 1-20 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7, 13-16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niksa et al. (US 5,196,276) in view of Fujita et al. (US Patent 6,225,779) and Okazaki et al. (JP 11-339828 A).

Niksa et al. teach a stacked battery made of a plurality of bipolar anode/cathode assemblies with electrolyte between the bipolar assemblies (column 2 lines 7-17).

Niksa et al. further teach measuring the voltage of the cell (column 8 lines 35-56).

As for claim 6, it would have been obvious to one having ordinary skill in the art at the time the invention was made to connect the cells in parallel instead of in series if a larger current output as opposed to voltage output was desired.

Niksa et al. fail to teach a power supply monitoring integrated circuit.

Fujita et al. teach a power supply monitoring integrated circuit for individually measuring the voltages of a plurality of lithium-ion cells connected in series (abstract).

Regarding claim 13, Fujita et al. teach a discharge control circuit (Fig. 2).

Fujita et al. further teach that the individual cell monitoring system offers more secure protection of the cells by detecting voltages with higher accuracy and by making correct judgments even when a disconnection occurs (column 3 lines 22-25).

It would be advantageous to use the individual cell monitoring system of Fujita et al. with the battery of Niksa et al., which only measures voltage across the entire stack, since the monitoring system of Fujita et al. offers more secure protection of the cells by detecting voltages with higher accuracy and by making correct judgments even when a disconnection occurs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the individual cell monitoring system of Fujita et al. with the battery of Niksa et al. since the monitoring system of Fujita et al. offers more secure protection of the cells.

Niksa et al. in view of Fujita et al. fail to teach tabs for measuring the voltages.

Okazaki et al. teach a fuel cell system that contains means for measuring each cell within the stack ([0003]). The voltages are measured by connecting leads to projections provided on the edges of separators within the fuel cell ([0008]). The

projections may be "tabular" in shape, which the examiner interprets to mean that they may be tabs ([0031]).

Although Okazaki et al. teaches a fuel cell, and Applicants' invention, and Niksa et al. in view Fujita et al., are drawn to a battery, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Okazaki et al. may be considered analogous art since Okazaki et al., the instant invention, and Niksa et al. in view Fujita et al. are concerned with power generation by cells that are formed in a stack. Further, all are pertinent to the particular problem of measuring voltage in individual cells in a stack.

Regarding the positions of the tabs disclosed in claims 1-5 and 16, Okazaki et al. fail to teach the deviated tabs on one or both sides of the stack. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the tabs in a deviated manner on the edge of the stack, since it would allow easier access to the tabs by eliminating some of the crowding resulting from the tabs being in a line. It has been held that rearranging parts of an invention involves only routine skill in the art. MPEP 2144.04 (VIC).

As for claim 14, Okazaki et al. teach a socket connected to the tabs ([0009]). The socket measures an electrical potential difference.

Regarding claim 15, Niksa et al. in view Fujita et al. in view of Okazaki et al. fail to teach that the socket and control system are integrally formed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to connect the socket to the controller, since the controller would need to obtain the measurements from the socket in order to obtain and process voltage information from the tabs. Further, by making the two parts integral, assembly of the system would be simplified. It has been held that forming in one piece an article, which has formerly been formed in two pieces, and put together, involves only routine skill in the art. MPEP 2144.04 (VB).

As for claim 20, Niksa et al. in view Fujita et al. and Okazaki et al. teach all of the claimed limitations as discussed above, including providing plurality of stacked unit cells connected in series and providing shared voltage measurement tab electrodes on the unit cells.

Okazaki et al. teach that having connections to tabs on each cell in a stack allows for detection of abnormalities in each cell more promptly ([0038]).

It would be desirable to provide tabs on each cell in the plurality of battery cells in Niksa et al. in view Fujita et al. as taught by Okazaki et al. in order to detect malfunctions in the cells.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide tabs on each cell in the plurality of battery cells in Niksa et al. in view Fujita et al. as taught by Okazaki et al. in order to detect malfunctions in the cells.

4. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niksa et al. in view Fujita et al. and Okazaki et al. as applied to claim 7 above, and further in view of Sato et al. (US Patent 6,589,690).

The teachings of Niksa et al., Fujita et al. and Okazaki et al. as discussed above are incorporated herein.

Niksa et al. in view Fujita et al. and Okazaki et al. teach a lithium ion battery having voltage measurement tabs but fail to teach the claimed materials for use in the battery cells.

Sato et al. teach a lithium ion secondary battery (abstract; column 1 line 16). The battery has a nonaqueous electrolyte that permeates the electrodes. This is desirable since it produces a battery with a satisfactory life cycle (column 11 lines 40-42).

Sato et al. also teach that the anode may be made of metal oxide or a carbonaceous material, since both are capable of absorbing and desorbing lithium ions (column 10 lines 13-17).

It would be desirable to use the anode materials taught by Sato et al. in the battery of Niksa et al. in view Fujita et al. and Okazaki since they are capable of absorbing and desorbing lithium ions; further, it would be desirable to use a nonaqueous electrolyte that permeates the electrodes since it would produce a battery with satisfactory life cycles.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the anode materials and nonaqueous electrolyte

that permeates the electrodes as taught by Sato et al. in the battery of Fujita et al. in view of Okazaki in order to produce a battery having anodes that are capable of absorbing and desorbing lithium ions and having satisfactory life cycles.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niksa et al. in view Fujita et al. and Okazaki et al. and Sato et al. as applied to claim 11 above, and further in view of Loutfly et al. (US Patent 6,146,791).

The teachings of Niksa et al., Fujita et al., Okazaki et al. and Sato et al. as discussed above are incorporated herein.

Niksa et al. in view Fujita et al., Okazaki et al. and Sato et al. teach a lithium ion battery having voltage measurement tabs having carbon materials contained in the anode but fail to teach the use of hard carbon in the anode.

Loutfly et al. teach the use of hard carbon in the anode of lithium-ion batteries since the resulting anodes have low irreversible capacity loss.

It would have been desirable to use hard carbon in the anodes of the battery of Niksa et al. in view Fujita et al., Okazaki et al. and Sato et al. as taught by Loutfly et al. in order to prevent high irreversible capacity loss.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use hard carbon in the anodes of the battery of Niksa et al. in view Fujita et al., Okazaki et al. and Sato et al. as taught by Loutfly et al. in order to prevent high irreversible capacity loss.

6. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niksa et al. in view of Fujita et al. and Okazaki et al. as applied to claim 13 above, and further in view of Evers et al. (US Patent 6,271,646).

The teachings of Niksa et al., Fujita et al. and Okazaki et al. as discussed above are incorporated herein.

Niksa et al. in view of Fujita et al. and Okazaki et al. teach the battery and controller of the claimed invention but fail to teach a current bypass circuit and electrical element that conducts depending on voltage.

Regarding claim 19, Fujita et al. teach that the power terminals contain resistors through which the power is transferred (column 3 lines 28-45, 54-61).

Evers et al. teach a battery charging and discharging network wherein the individual cell voltages are measured and used in operation of the battery.
Evers et al. further teach circuitry for bypassing charging current to cells that have been measured at voltage levels equal to or higher than a specific voltage level (abstract).

As for claim 18, the element that provides voltage to an individual cell inherently would not conduct when the cell was greater than a certain voltage in order for the bypass circuit of Evers et al. to function.

The by-pass circuitry of Evers et al. prevents overcharging of cells and waste of energy by-passed from full cells, and equalizes the state of charge in the cells (column 2 lines 1-15).

It would be desirable to use the by-pass circuitry of Evers et al. with the discharge controller of Fujita et al. since the functions of the by-pass circuitry of Evers et

al. would be desirable for discharging: in discharging, it would be desirable to prevent over discharging of cells, it would be desirable to prevent energy waste, and it would be desirable to equalize the state of charge in the cells.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the by-pass circuitry of Evers et al. with the discharge controller of Niksa et al. in view of Fujita et al. in order to prevent over discharging of cells and energy waste, and to equalize the state of charge in the cells.

Response to Arguments

7. Applicant's arguments, see Remarks, filed July 19, 2007, with respect to the rejection over Fujita et al. over the stacked battery limitations have been fully considered and are persuasive. The rejection is withdrawn. A new ground of rejection has been made, see above.

8. Applicant's arguments concerning the rejection over Okazaki et al. have been fully considered but they are not persuasive. Applicant argues that Fujita et al. and Okazaki et al. are not analogous art, since Fujita et al. is concerned with batteries and Okazaki et al. is concerned with fuel cells.

The combination was addressed in the Non-Final Rejection mailed April 19, 2007 and also above. Fujita et al. and Okazaki et al. are analogous art, since both are concerned with current collection and voltage detection in electrochemical cells. Since fuel cells and batteries are both concerned with generating electricity and have many of the same parts, namely anodes, cathodes, electrolytes and current collectors, the two

fields are analogous. Additionally, fuel cells and batteries are classified in the same class, 429.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Freeman et al. (US 2002/0196025) teaches a method and apparatus for measuring voltage characteristics of cells in multi-cell devices, such as a battery or fuel cell.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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aee

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PRIMARY EXAMINER